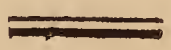


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OBSERVATIONS
ON
THE EFFECTS
OF
EVACUATING THE AQUEOUS HUMOUR,
IN
INFLAMMATION OF THE EYES;
AND ON
THE CHANGES
PRODUCED IN
THE TRANSPARENCY OF THE CORNEA,
FROM THE INCREASE OR DIMINUTION OF THE
CONTENTS OF THE EYE-BALL.


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OBSERVATIONS,*

&c. &c.

DR BARCLAY, some years ago, when injecting a bullock's eye with mercury, observed that the cornea suddenly assumed a milky colour; from which he concluded, that the fluid had filled its vessels. On handling and pressing the eye-ball afterwards, the cornea soon regained its transparency; and he was led to infer, that the injection was forced back by the pressure, and by the elasticity of the vessels. Wishing, however, to possess a preparation, with the vessels of the cornea injected, he took another eye; and, while removing the muscles, he found, that the appearance observed from the injection, was in reality occasioned by the pressure pushing forward the humours, and distending the cornea.

He was further confirmed in this opinion, by the same opacity being produced when he injected the blood-vessels with pure water; and also by the following simple experiment: If the eye of a sheep or ox be moderately squeezed in the hand, the whole cornea instantly becomes cloudy. When the pressure is increased, the obscurity increases; and, if it is still increased, the cornea becomes of
such

* *Extracted from the Edinburgh Medical and Surgical Journal, Vol. 3. No. 9.*

such an opaque milky colour, that the iris cannot be distinguished through it. Whenever the pressure is removed, the cornea completely regains its transparency, and appears as if no such experiment had been made. From this curious phenomenon in the dead eye, he concluded, that, in the living body, the transparency of the cornea might vary according to the degree of its distention; and that, in some varieties of opacities of the cornea, the obscurity might arise from an increase of the contents of the eye-ball.

Besides the effects of local blood-letting, purging, &c. the means usually recommended for the treatment of the inflammation which generally accompanies opacity of cornea, in producing a diminution of the contents of the eye-ball, it occurred to me, that the same object might be more effectually accomplished, by the evacuation of the aqueous humour itself, through an opening made in the transparent cornea. I had reason to think that there was little danger of this operation producing any disagreeable symptom, being aware that the cornea has but a small share of sensibility in the natural state; and that incisions made into it, during various operations, produce almost no pain, and are followed only by a very slight degree of inflammation. I mention this, in order that the practice which is recommended may not be abandoned, from any preconceived notions of its severity.

A favourable case for the trial soon occurred to me, where there was a very considerable degree of milkiness and opacity of the cornea, and in which the eye-ball appeared distended and prominent, attended, at the same time, with acute inflammatory symptoms. In this case I discharged the aqueous hu-
mour

mour by a small incision ; and I had the satisfaction to find, that the operation produced not only an alteration in the degree of the transparency of the cornea, but that the pain, and all the inflammatory symptoms which accompanied the disease, were suddenly removed.

From the success of this case, I was not only convinced of the good effect which this operation might have, in diminishing opacities of the cornea, and of the safety of performing it ; but I was induced to perform it, merely with a view of removing the inflammatory symptoms, in cases of the more violent inflammation of the eye-ball, in which the cornea had no share in the disease. I shall now relate some of those cases which are most remarkable, and which most strikingly illustrate the good effects of the practice I propose.

CASE I.

March 1808.

A gentleman, about 21 years of age, had a very violent inflammation of the left eye-ball. The *sclerotica* was covered with numerous scarlet coloured blood-vessels ; but none of them passed over the transparent cornea. The anterior chamber was turbid ; and several small spots, of a matter resembling pus, were seen in it, towards the circumference of the cornea. The pupil was much contracted, the eye-lids swelled, and their external surface covered with varicose veins. There was a constant flow of acrid tears. Vision was almost entirely destroyed ; but, notwithstanding, the eye was extremely sensible

sible to light. He had great pain in the eye-ball, and constant headach, with a sense of fulness in the orbit. The inflammation had begun five weeks before, without any known cause, and every symptom had, since that time, gradually increased.

I made an incision with an extracting-knife through the cornea, and the aqueous humour spirted out. From the difficulty in securing the eye-ball, the pressure employed gave considerable pain. The incision smarted for two or three minutes ; but, before I left the room, he said he found great relief ; and that the pain in the eye-ball and head, and the peculiar feeling of weight and distention, were entirely removed. On examining the anterior chamber, all the turbidness had disappeared, and the cornea seemed perfectly transparent. He was advised to do nothing but foment the eye and the neighbouring parts, and to take a purge. As he lived at some distance from town, I had no opportunity of seeing him afterwards ; but I was informed by Dr Mitchell of this place, with whom I had visited him, that an hour after the operation, all the pain, occasioned by the incision and the pressure, was entirely gone, and the eye had become quite easy. In two days all redness went off ; and Dr Mitchell, who saw him five days afterwards, said, that he could not discover the mark of the incision ; that the inflammation had disappeared ; and that his vision was nearly as perfect as it had been before the commencement of the disease. Some months afterwards, I heard that he continued perfectly well.

CASE II.

A young man, seventeen years of age, had been subject to repeated attacks of deep-seated ophthalmia, which had yielded chiefly to anodyne applications. On the 28th of March 1806, his left eye was again attacked with a violent inflammation; and I saw him the following morning. The sclerotic coat was interwoven with numerous blood-vessels. The iris was much contracted; and the cornea remained transparent. There was an increased flow of tears; extreme sensibility to light; and great pain in the eye, accompanied with a sense of distention. I evacuated the aqueous humour, as in the former case; and advised afterwards, the use of fomentations. The operation gave him very little pain: and on the following day there was no mark of the incision; the pain was much abated; and the sensation of fulness entirely gone. The redness of the sclerotica lasted for several days; and he had for some time a tenderness in both eyes; but neither the pain nor the sensation of distention returned.

CASE III.

August 28th 1806.

A sailor boy, thirteen years of age, felt an itching sensation in his right eye, which, by constant rubbing, became red and painful. About eight weeks after, he was at sea in a storm of thunder and lightning, which increased the inflammation. The
left

left eye also, at that time, became affected. I saw him about ten weeks after the first attack. The anterior chamber of the left eye had become dull and cloudy ; and there were three or more milk-white spots on the cornea, of the size of a pin's head, perfectly round, and distinctly circumscribed. The pupil was a little contracted ; and there was only a very slight redness of the sclerotica, near to its union with the cornea. There was also a general cloudiness of the cornea of the right eye ; and, on the inferior part of it, there was a speck of considerable size, with several red vessels ramified through it. There was also some small opaque circular specks on different parts of the cornea. The blood vessels were more numerous on the sclerotica of this eye than of the left. Exposure to light gave him acute pain in both eyes, and made them gush with tears. He had violent pain in both eyes, but particularly in the right ; and he described the pain as having been extremely severe the day before, through his whole head. He also felt a sense of distention or weight over the eye-brow, and had a little general fever. A by-stander observed, that his eyes appeared too full.

I made an incision into the cornea of the left eye, and the aqueous humour spirted out forcibly. The operation occasioned smart pain for two or three minutes, similar to that produced by dropping the vinous tincture of opium into the eye. A little blood afterwards appeared in the anterior chamber, which was effused in consequence of the division of the red vessels which entered the cornea. The operation was afterwards performed on the right eye, and it caused more acute pain than in the left, for the incision was made through

a cornea which was highly vascular, and had acquired a morbid degree of sensibility. In a few minutes, all the pain, which he conceived to arise from the cut, went away; and the uneasy fulness and distention in both eyes were greatly diminished. He was ordered to use fomentations, and to take a purgative medicine. I saw him three days afterwards: he had no return of the pain of the eye or head: he could endure the light; and his vision was so perfect, that he walked two miles, and could distinguish readily, and without uneasiness, all objects around him. The opacities of the cornea of both eyes were greatly diminished; and there was very slight redness of the sclerotica.

CASE IV.

July 1805.

A healthy looking man, 45 years of age, had inflammation in both eyes for six weeks, which began after the abatement of a violent pain of his head. There was a general cloudiness of the cornea of the left eye. The iris could be distinguished but indistinctly. There were numerous vessels on the white of the eye; and they formed clusters on different parts, giving it a mottled appearance. The eye looked unnaturally dry; and there was no intolerance of light. The disease in the right eye had the same appearances; but the cloudiness was limited to two-thirds of the cornea; and the red vessels were not so numerous as in the left. The vision of the left eye was almost entirely destroyed; and with the right one, every object appeared

ed as if seen through a mist or smoke. Both eyes looked full and prominent. An eye-water, of corrosive sublimate, and the application of an ointment composed of the red oxyd of mercury, diminished, in a few days, the inflammation and opacity of the right eye. The obscurity of the left cornea, however, increased, so that the iris and pupil were very indistinctly seen through it.

I perforated the left cornea with a spear-pointed couching-needle, and immediately it appeared clearer to several bystanders. The operation was attended with no pain, neither was it followed by any inflammation. He afterwards used a wash of the nitrate of quicksilver, and the cornea soon regained its transparency. The pupil, however, remained a little irregular, with a slight dimness behind it; and objects appeared with this eye as if through a mist. By the external application of sulphuric ether, the dimness disappeared; and I saw him eight months afterwards, when he told me that he then saw as well as when he was a boy; for he had been short-sighted before his eyes became inflamed; and probably the operation may have diminished the natural convexity of the cornea.

CASE V.

While a strong healthy workman was employed hammering melted iron, a piece of it fell into the eye, and was found lying between the eye-ball and under eye-lid. It occasioned most excruciating pain; and, although it was removed in a few minutes, violent inflammation succeeded; and in four
days

days after the accident he came to Edinburgh. The whole conjunctiva was then very much inflamed, and it was so much swelled, that the cornea appeared as if depressed. There was a white slough towards the inferior part of the sclerotic coat, and on the corresponding portion of the internal palpebral membrane; but the cornea was not injured, nor its transparency diminished. He complained of great pain in the ball of the eye, extending over the forehead, and through the whole side of the head. He could not raise the upper eye-lid without the assistance of his finger. Light gave considerable uneasiness; and his vision was so much destroyed, that he could only distinguish between light and darkness.

In this situation, I discharged the aqueous humour, by making a small opening through the transparent cornea. The operation occasioned a smarting pain, which lasted a few seconds. When it went off, he said he could open the eye-lid much easier; and was surprised to find that he could distinguish the furniture of the room, and books in a library. Slight scarifications were afterwards made on the under eye-lid, which bled freely; and he was advised to use fomentations to the temples and adjacent parts; and as his pulse was frequent and full, he was bled at the arm, and ordered a brisk purge. During the day, the pain of the eye-ball was much alleviated, and that of the head was completely removed, except an uneasy sensation still remaining in the brow. On the following day there was no vestige of the wound of the cornea; the pain and the swelling of the conjunctiva were nearly gone, but the redness continued. His vision was quite distinct, but the eye was irritable. In three days, by the application of an opiate, the inflammation

inflammation was completely removed, his vision perfectly restored, and he returned home, complaining merely of a little tenderness. Since which time he has remained well.

Another case of inflammation, similar to the former, also occurred to me; and although the symptoms were not so very severe, yet the effect of the evacuation of the aqueous humour was no less remarkable and efficacious in removing the inflammatory symptoms.

These are the most remarkable cases which I have met with; where the evacuation of the aqueous humour was followed by a sudden and permanent abatement of the inflammatory symptoms; and in two of the cases, it may be observed, that it also diminished the opacity of the cornea. I have also performed the operation in a few cases where the inflammation was not severe. In these it was not followed with so marked an abatement of the symptoms; but in none did it increase the inflammation, or was it followed by any disagreeable consequence. In other cases, in which I have performed it, I had no opportunity of observing the patients with that attention afterwards, as to be able to draw up the cases for public inspection.

I have, in several instances, evacuated purulent matter, collected in the anterior chamber, and necessarily, along with it, the aqueous humour; a practice which has been strenuously recommended by some, and as much condemned by others.

I have observed it invariably followed by a sudden abatement of pain, and every other symptom of inflammation; so that, in all cases where there is even the smallest quantity of pus, accompanied with symptoms of violent inflammation, I would, without hesitation, discharge the contents of the anterior

rior chamber. It is highly probable, that the success which attended this practice, in the hands of those who have recommended it, may be accounted for, from the effect produced by the discharge of the aqueous humour alone*.

I will not pretend to explain the *modus operandi* of this operation; but I think it probable, that the great and immediate relief which it affords, chiefly arises from the sudden removal of tension. The pain accompanying inflammation in other parts of the body is, in general, in proportion to the degree of tension and resistance of the contiguous parts; and it is well known how much relief is given in deep-seated inflammation, such as inflammation of the periostæum, or in whitlow, by making a free incision through the skin and external parts.

The mode of performing the operation is very simple. The chief difficulties generally arise from the irritability of the eye, rendering it troublesome to be kept steady; but these are to be overcome by attending to the rules generally recommended in the operation of the extraction of the cataract. The incision may be made with a small extracting-knife; and if it is oiled, it cuts much keener. It is sufficient to introduce the knife into the cornea, so as to make an incision its own breadth, at the usual place of making the incision for the extraction of the crystalline

* The ingenious Mr Ware of London has recorded the case of a lady, who had symptoms of amaurosis, accompanied by very violent pain in the eye-ball, when, by making a perforation through the sclerotic coat, he evacuated a considerable quantity of a yellow fluid, which had collected between the choroid coat and the retina; and this operation was followed by a sudden abatement of the excruciating pain which accompanied the disease.

crystalline lens ; and by turning the blade a little on its axis, the aqueous humour flows out along its edges.

There is an observation which may be mentioned in this place, as it may illustrate the remarks which have been made on the changes which take place in the cornea of the dead eye, from alterations in its tension.

It is well known to those who are employed in the management of sheep, that if they have been much fatigued, or have made long journeys, that they are subject to a species of blindness, produced from an obscurity of the cornea. From the accounts I have been able to collect, the disease comes on in a very short time, in one or two days ; and it is attended with little apparent inflammation. I have only had one opportunity of seeing the animal afflicted with this complaint. Both eyes were equally affected, and the corneæ were very opaque ; in some parts of a shade as deep as the sclerotic coat. There was very little appearance of inflammation, either of the eye or eye-lids, and the animal did not seem to suffer pain or uneasiness.

The treatment generally employed by shepherds, for the cure of this species of blindness, is opening a vein on the inferior part of the *orbit*, and allowing the blood to flow over the eye-ball. Generally, in a few days after this operation, the cornea regains its transparency, and vision is restored *. I have al-

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* Since these observations were published, there are, in a very valuable essay of Dr Duncan junior, on the Diseases of Sheep, published in the Transactions of the Highland Society of Scotland, the following interesting remarks under the head of Blindness, p. 109. He quotes the

so been informed by Mr Smith, that it is by no means unusual for horses, such as *hunters*, who have been all winter fed in stalls, to become blind for two or three days after they are put out to grass. This, he supposed, might be accounted for, from the change of posture of the heads changing the quantity of blood going to the eyes, and consequently, an alteration in the tension of the coats.

Edinburgh, 21st Sept. 1806.

the words of Mr James Hog. “ It is occasioned by a continued
 “ fatigue for a length of time, which will bring it on at any
 “ season of the year. Thus, sheep that are long and hard driven,
 “ or such as are daily dragged from one part of the ground to
 “ another; ewes that are eild, and roughly used by the women, dur-
 “ ing the time they are milked, and hogs which are fatigued by driv-
 “ ing through snow, to preserve their subsistence, are all subject to it.
 “ Their eyes at first become sore, and emit a sort of ropy humour;
 “ after which a white film settles over them, and if they continue to be
 “ fatigued, it grows thicker, and the eye appears perfectly white; in
 “ which case, they are proportionably longer of mending. For this,
 “ some bleed them below the eyes, and let some of the blood run into
 “ each of them; but the enjoyment of ease will infallibly cure them, in
 “ a space of time, proportioned to the fatigue which they underwent
 “ before.”

